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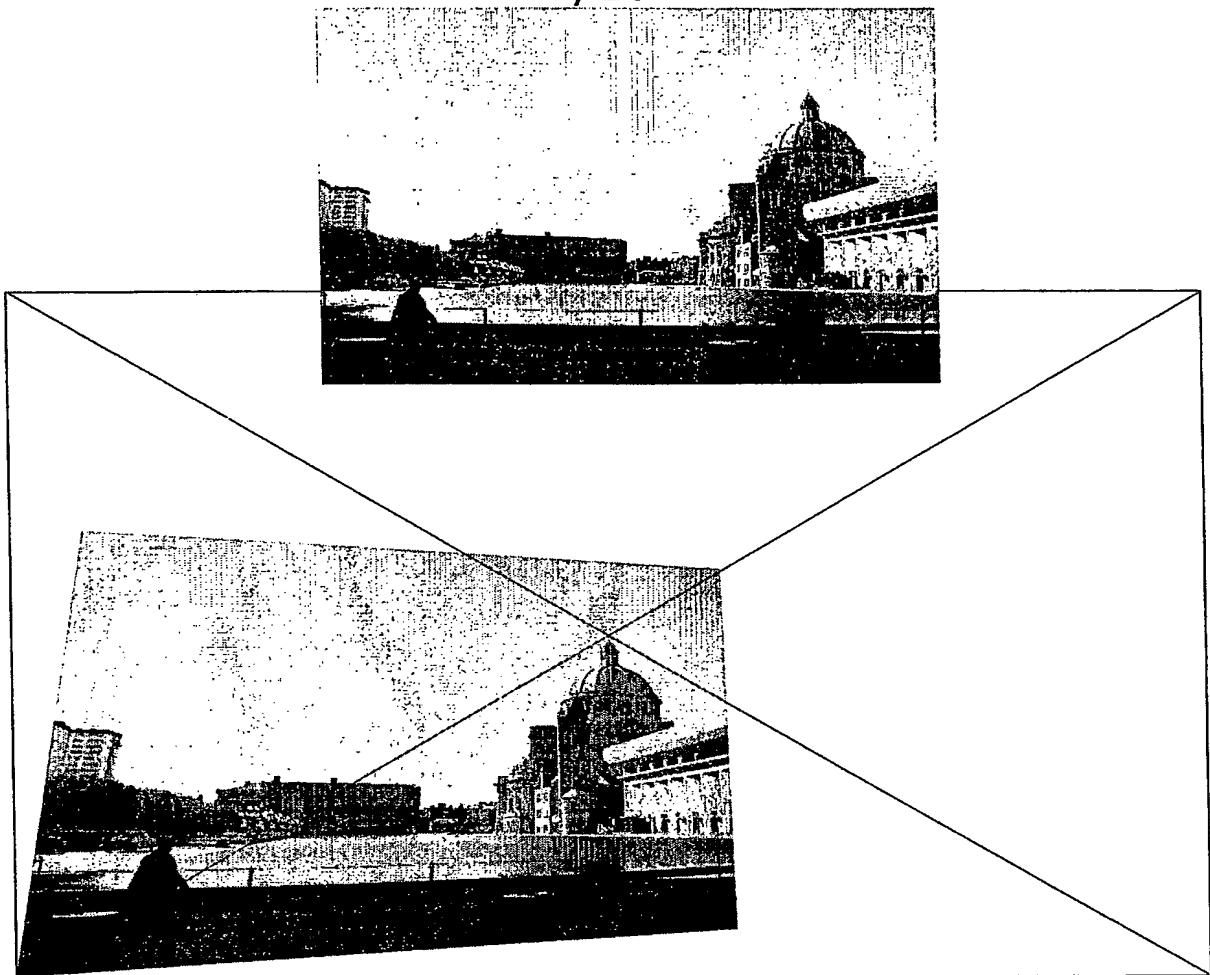


Fig. 1

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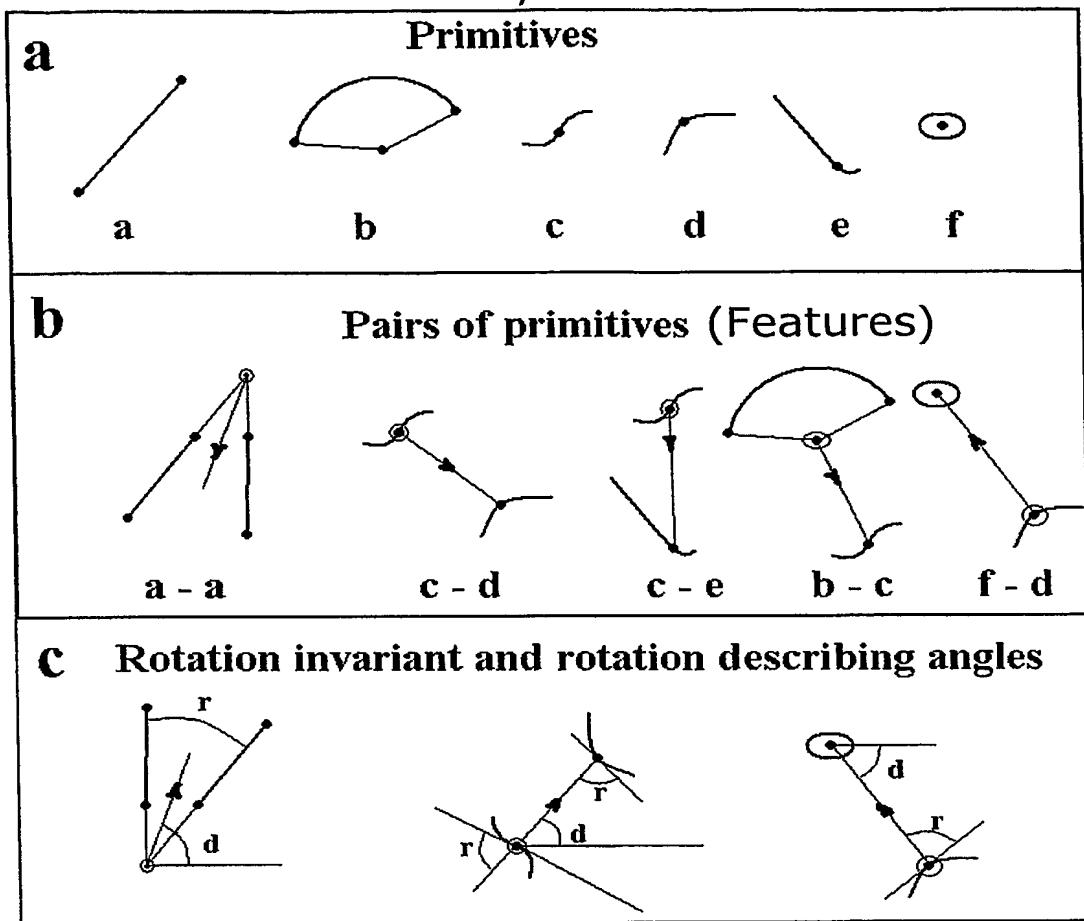


Fig. 2

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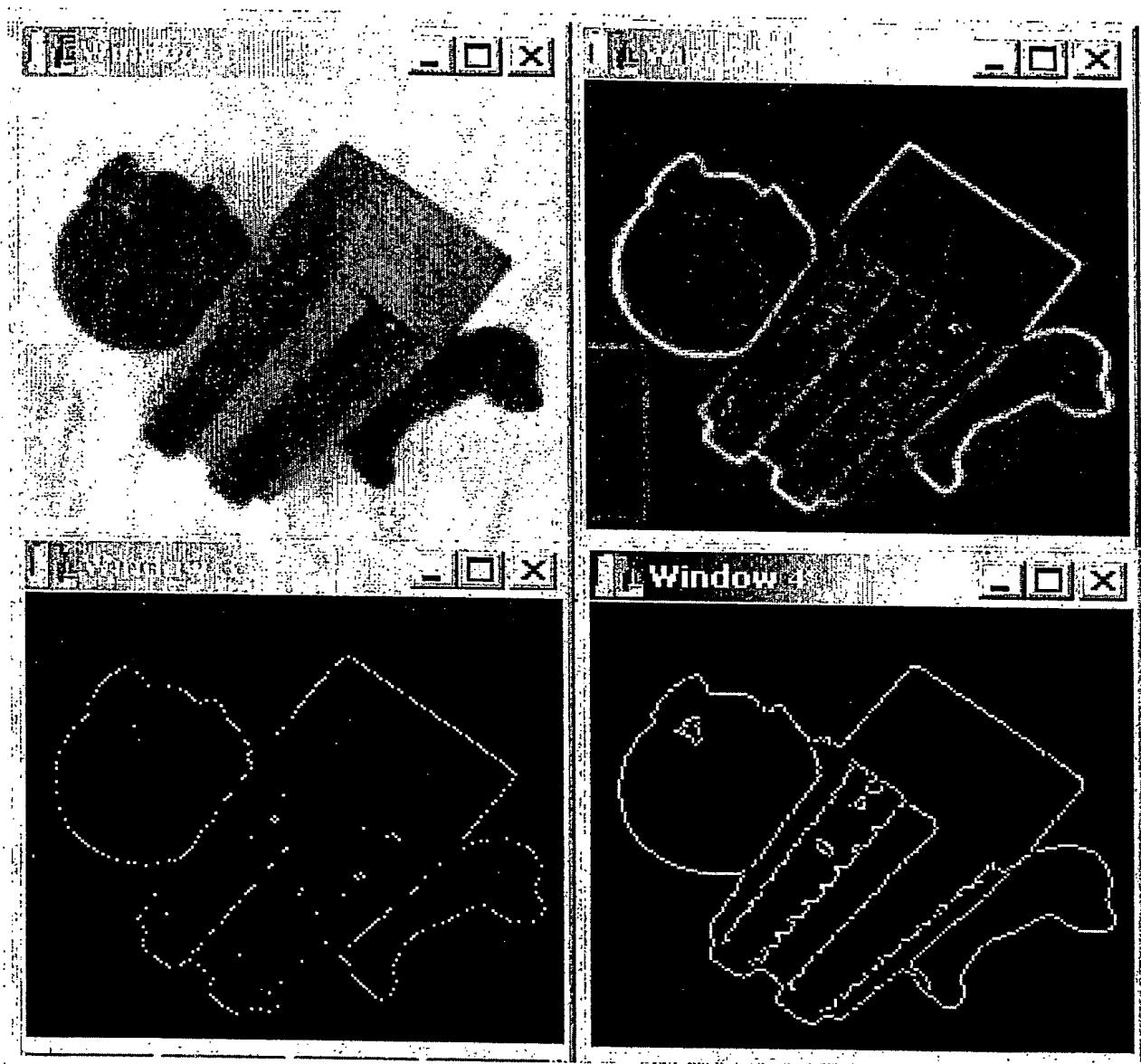


Fig. 3

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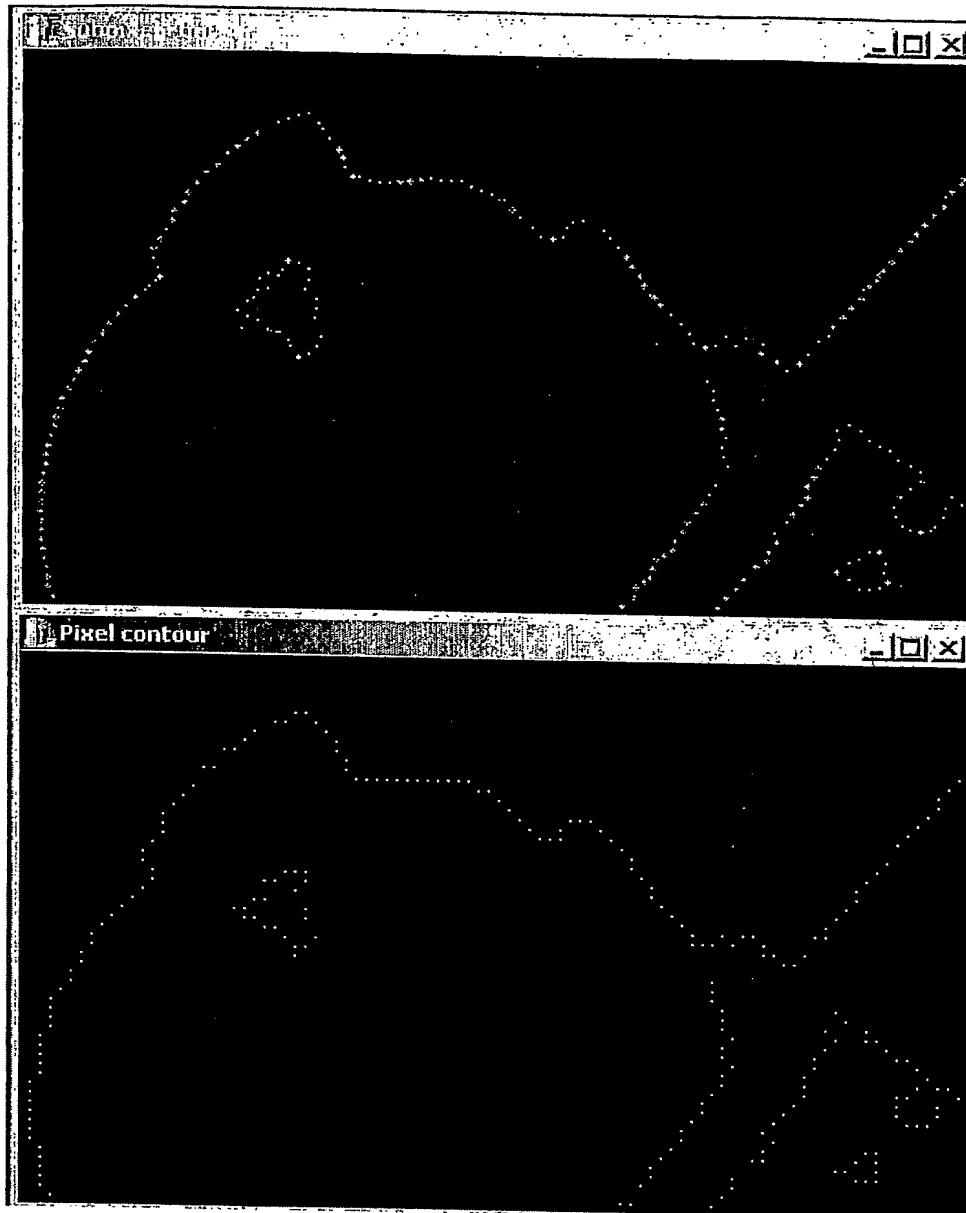


Fig. 4

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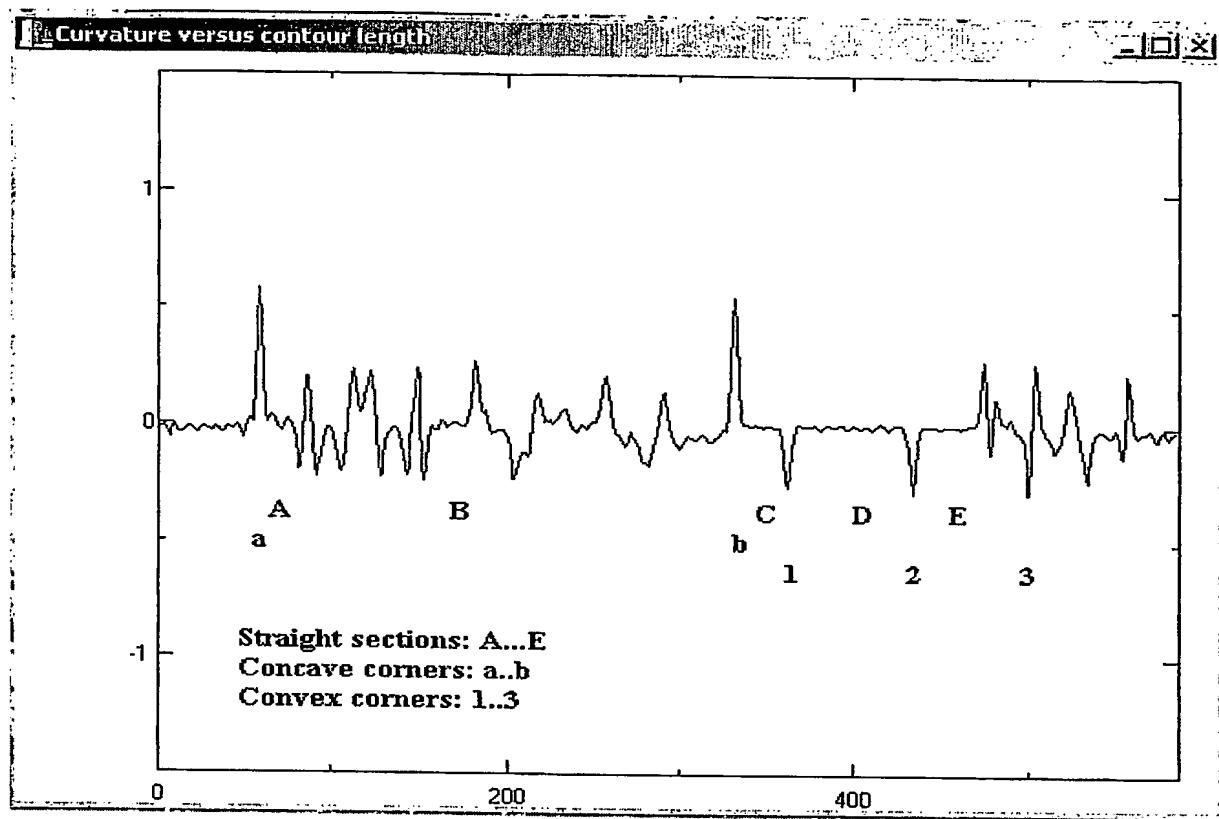


Fig. 5

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Fig. 6

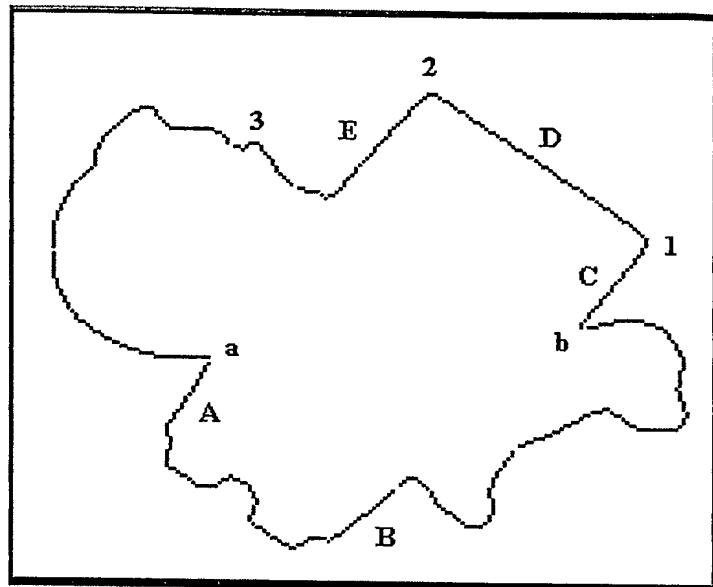
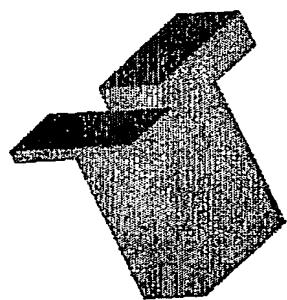


Fig. 7



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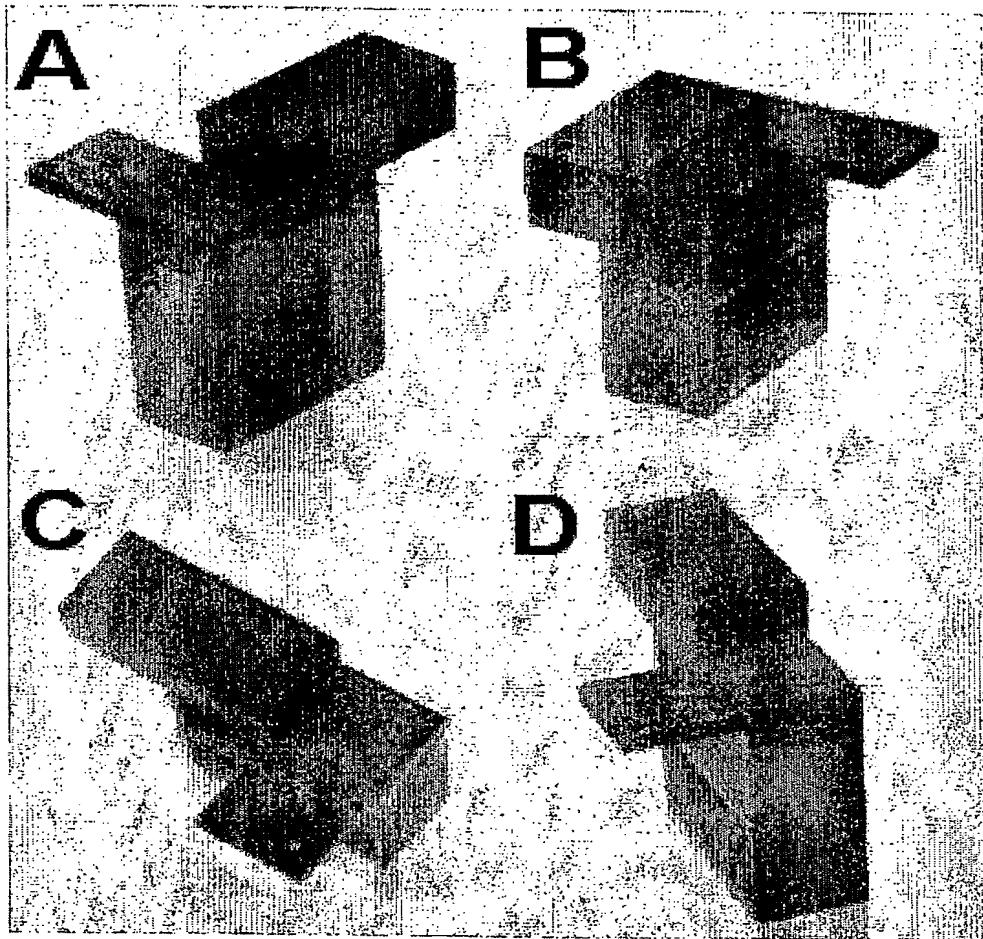


Fig. 8

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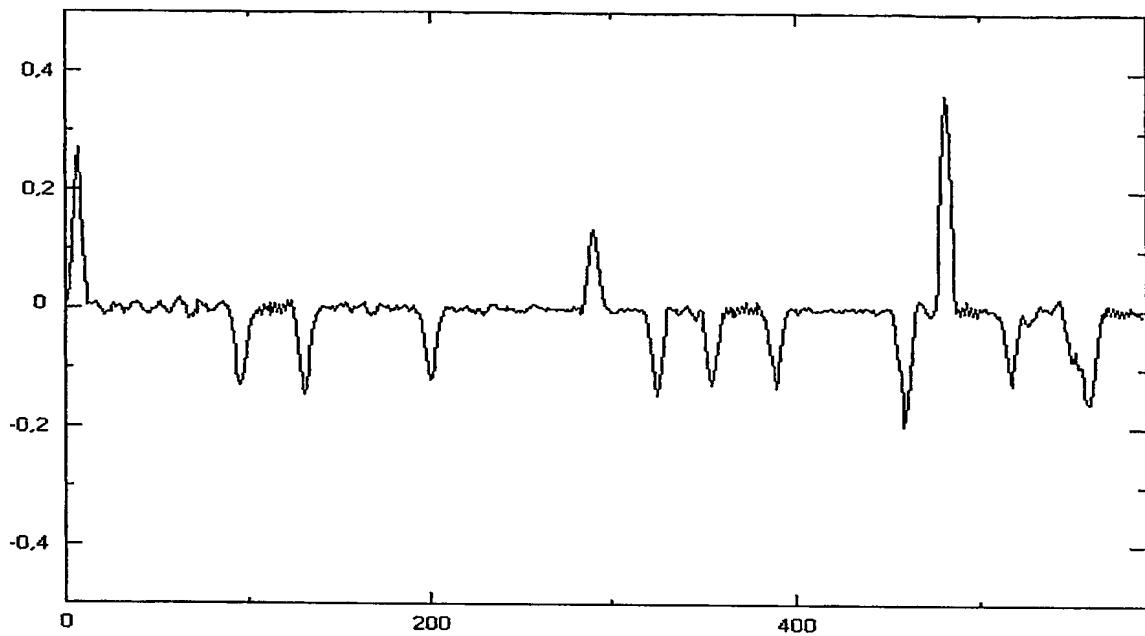


Fig. 9

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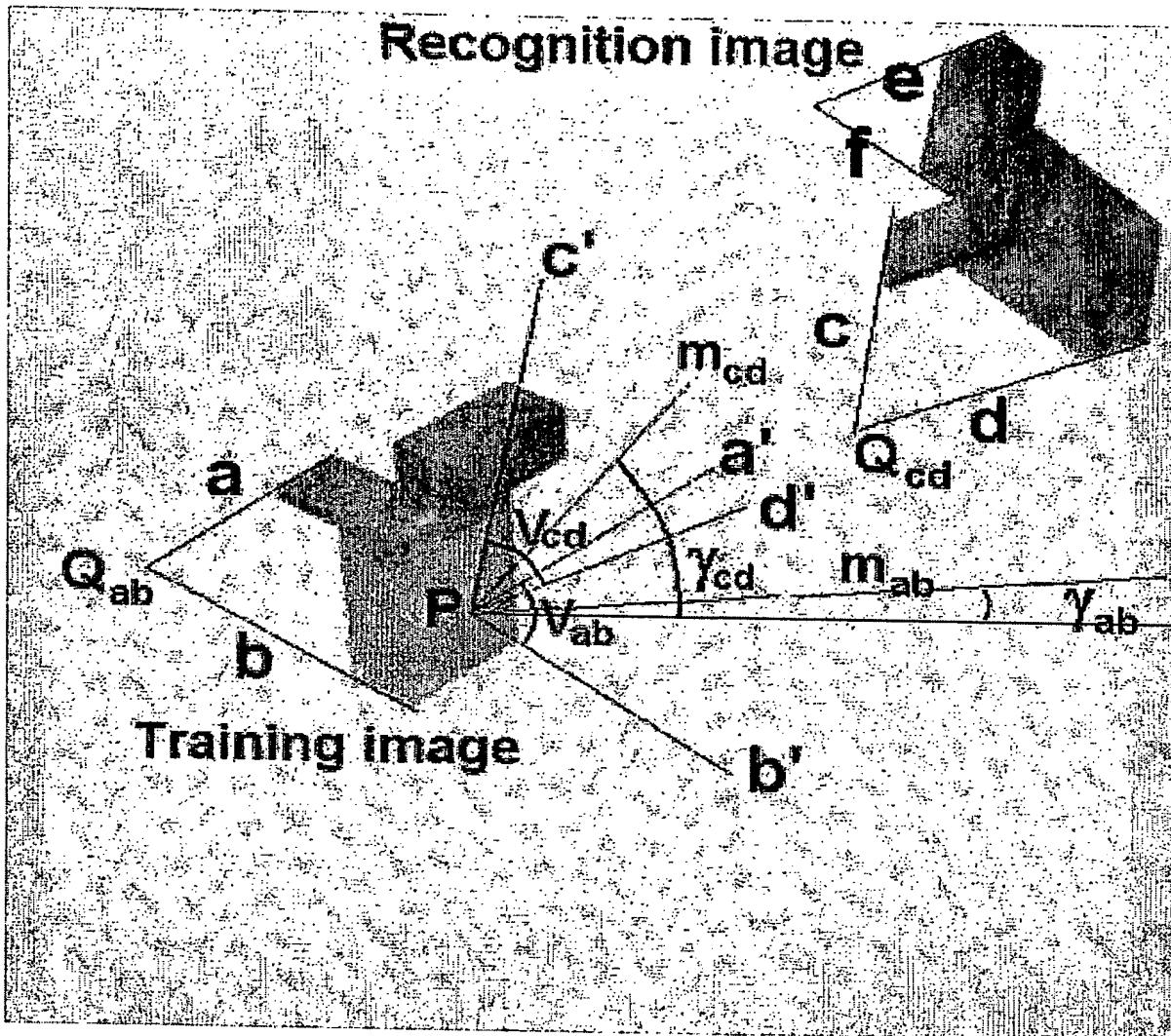


Fig. 10

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Training flow chart

Initiate the discretization of the training configuration space ($ic, \rho, \varphi, \theta$) and the corresponding database. ic is the object index, ρ, φ, θ define object poses during training

For each coordinate set (ρ, φ, θ) and object with index ic :
Record or construct a training image

For each training image: Derive level contours

For each level contour: Derive primitives

Derive features and their reference points. After homographic transformation, derive descriptors and the angles from the horizontal image axis to the reference direction.

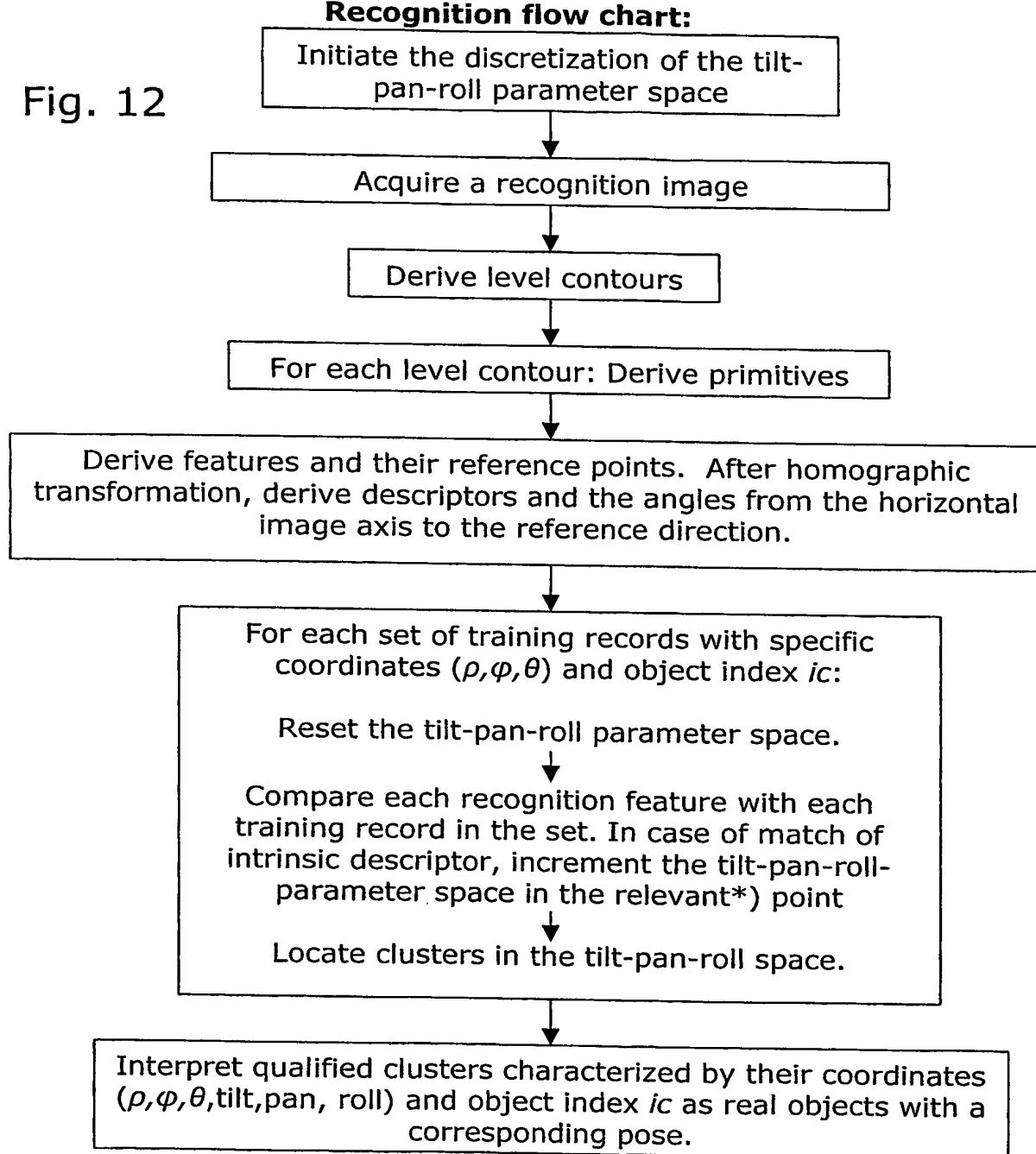
For each feature store a database record including:

- Index ic and indices of the (ρ, φ, θ) coordinates
- 2D coordinate of the reference point
- Angle from the image axis to the reference direction (after homographic transformation)
- Intrinsic numerical descriptor (after homographic transformation)

Fig. 11

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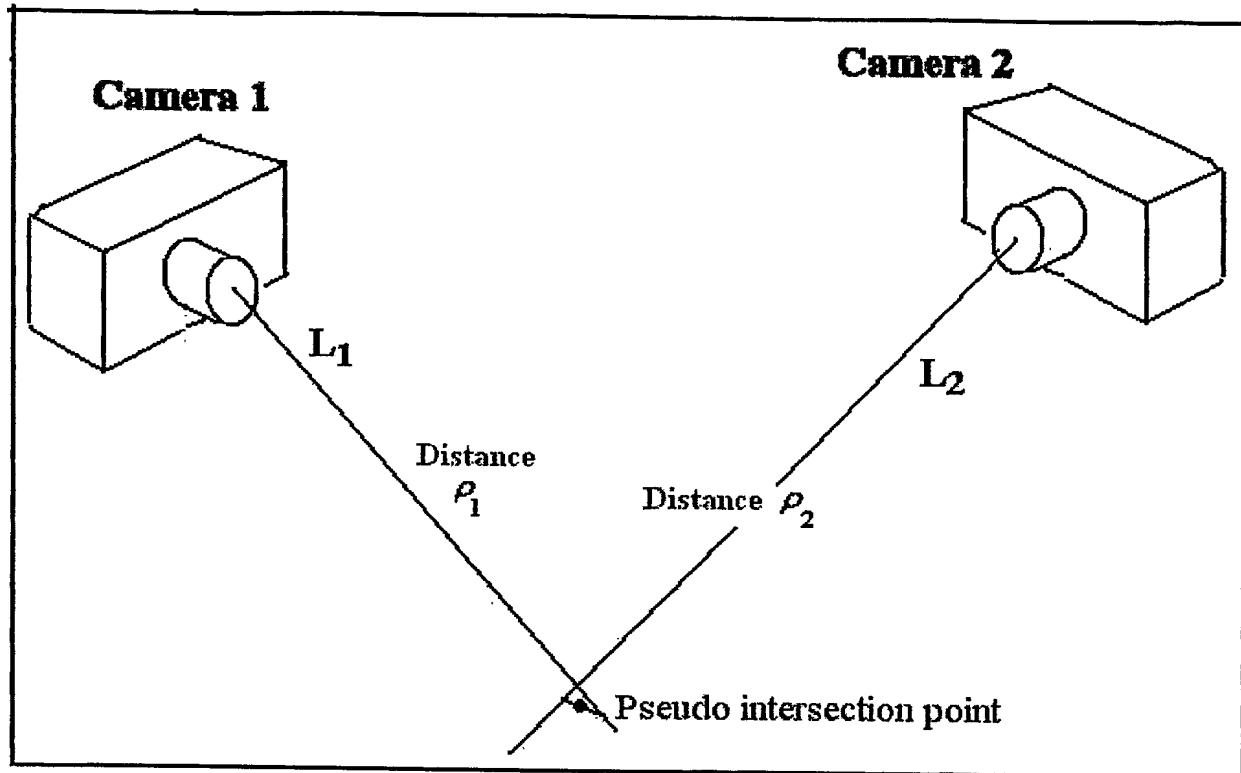
Fig. 12



*) The (tilt, pan, roll) define the angular offset between the potential recognition pose and the actual training pose. This coordinate set is derived using the reference points and reference directions of both training and recognition features, see Appendix A

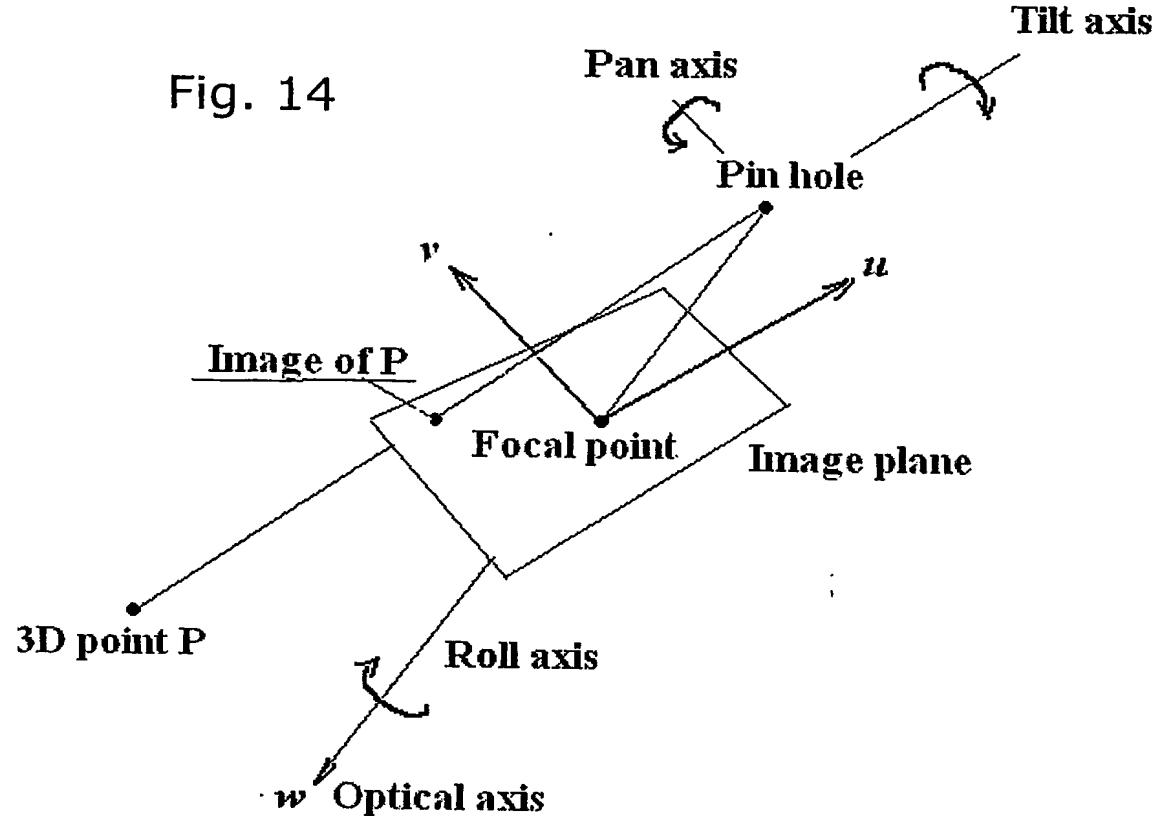
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Fig. 13



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Fig. 15a

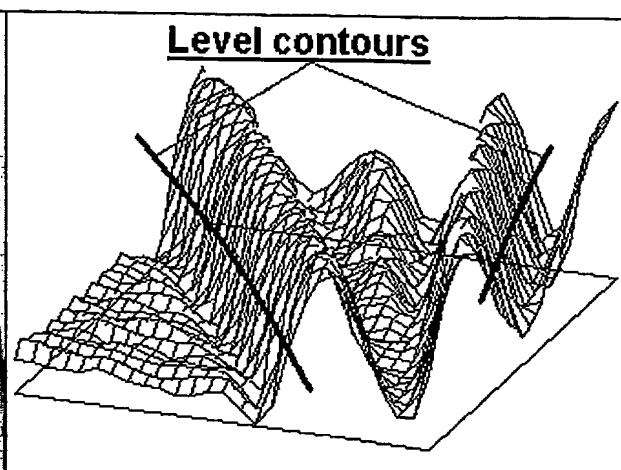


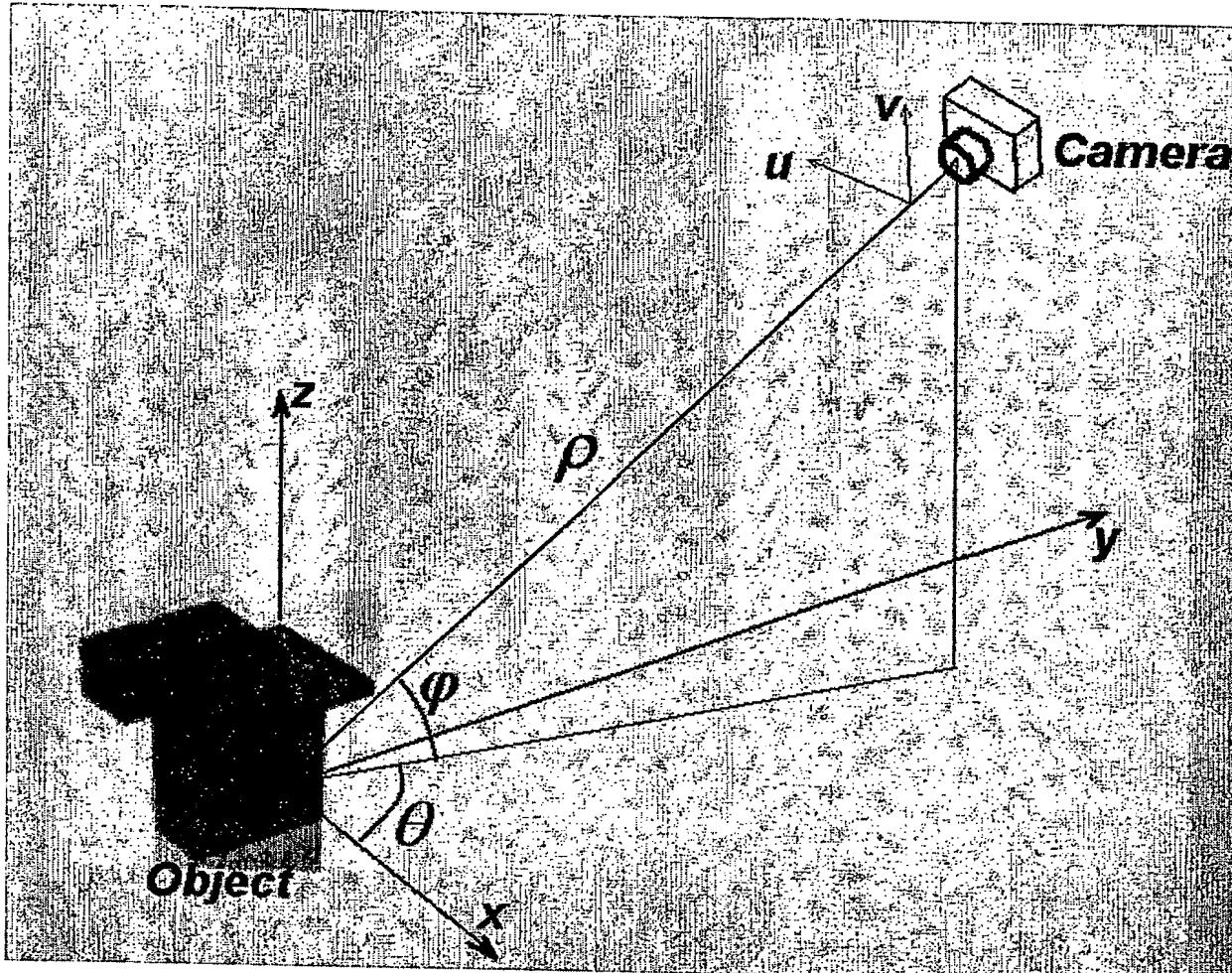
Fig. 15b

Fig. 15

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Fig. 16



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Fig. 17

Table A - Structure of the database of descriptors derived from training images

	Intrinsic descriptors Λ			Extrinsic descriptors		
	ref.point	ref.point	ref. dir
Training image 1 $\rho_i, \varphi_j, \theta_k$	u_0	v_0	γ

.....		

 $\Pi_{1,1}$
 $\Pi_{1,2}$ $\Pi_{2,1}$
 $\Pi_{2,2}$

Fig. 18

Table B – Structure of descriptors derived from a recognition image

Intrinsic descriptors Λ			Extrinsic descriptors		
			u_0	v_0	γ

.....		

 π_1
 π_2